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## (54) Bulk container bags

(57) An intermediate bulk container bag comprises one or more pieces of fabric secured together to form a container having at least a base and four sides and a pair of spaced apart reinforcing members (11,13) in the form of elongate box sections which serve as guides for receiving the tines of a fork lift mechanism, and are secured to the base of the bag by loops (7,9) depending from the base of the bag. Conveniently, the base and two sides are formed out of one length of material and the loops are formed in the same length of material.

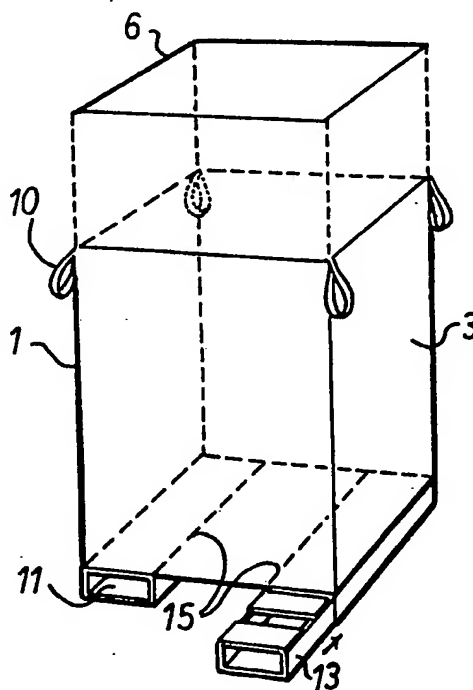


Fig 4.

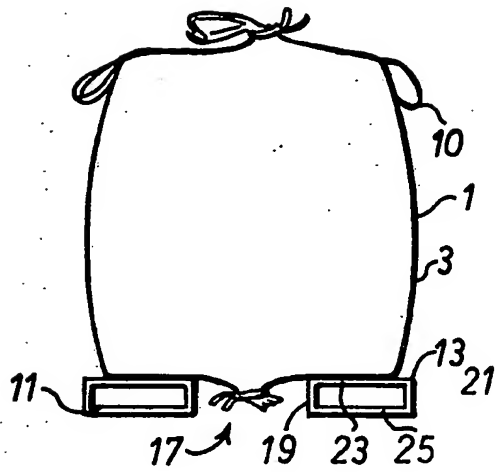


Fig 1

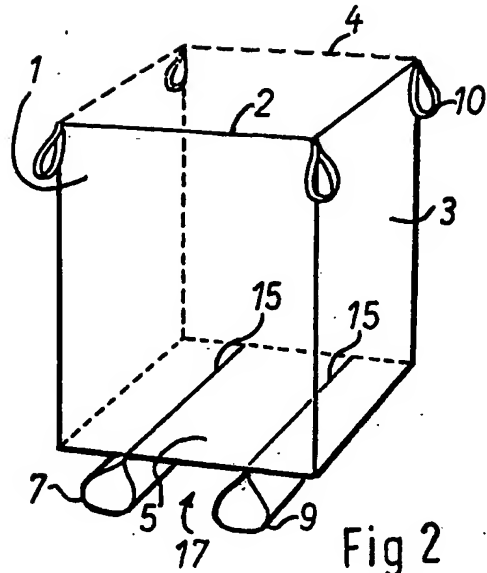


Fig 2

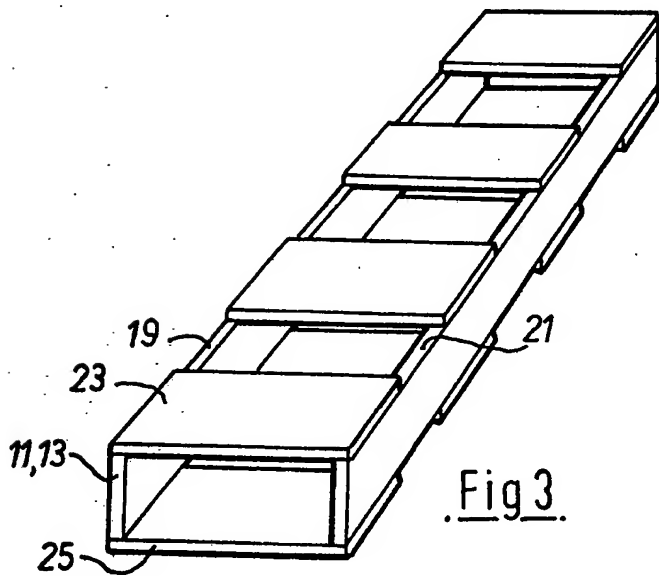


Fig 3

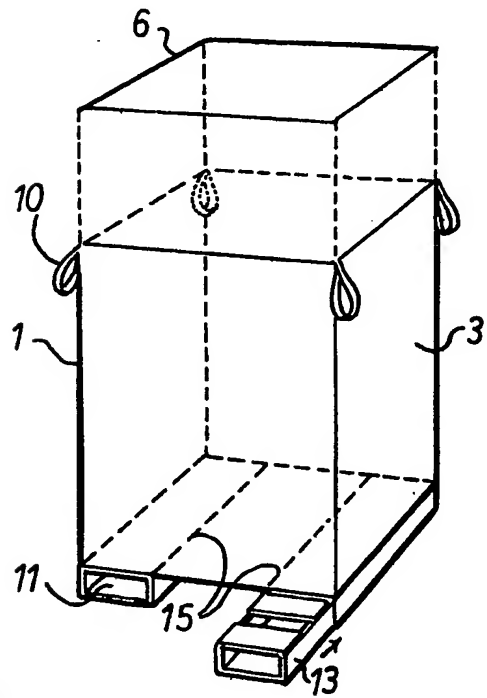


Fig 4

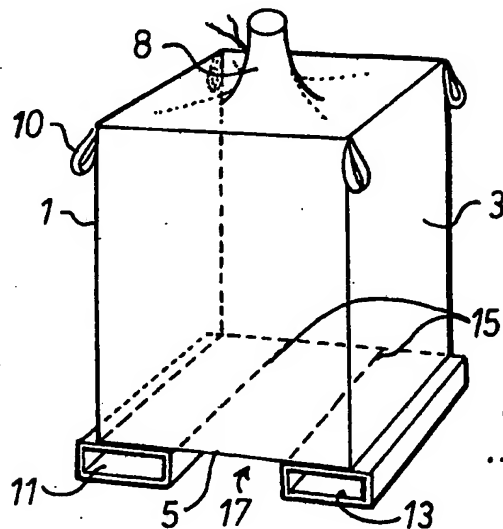


Fig 5

## SPECIFICATION

## Improvements in or relating to bulk container bags

5 The present invention relates to improvements in or relating to bulk container bags, and in particular flexible intermediate bulk container bags.

Bags of this type are typically used to hold 1/2 ton or more of powdered or granular material and 10 mechanical handling apparatus is essential to move the bags. It is known to provide such bags with loop handles so that the bags can be lifted from the top by an arm lifter or the like. Top lifting enables the contents to be simply discharged by 15 slitting the base of the bag whilst suspended, but has the disadvantage that the bags cannot be easily moved inside buildings with low headroom; and only one bag can be handled at a time.

Placing the bags on a conventional pallet enables them to be lifted from the bottom using a 20 conventional fork lifter and so solve the problem of low headroom, but this has the disadvantage that the contents of the bag cannot be discharged. In order to solve this problem it has been proposed 25 to modify a pallet by removing the central section so as to provide a pallet with two hollow channel members forming opposite sides of the pallet with an interconnecting piece at each end. This solves the problem of discharge without resorting to top 30 lifting but suffers from the disadvantage that two separate unconnected components are required, namely bag and pallet. With two separate components there is always the danger that they could become separated if, for example, the safe angle of 35 inclination is exceeded.

It is an aim of the present invention to provide an improved container bag which solves the above mentioned difficulties and which allows discharge with bottom lifting.

40 According to the present invention there is provided an intermediate bulk container bag comprising one or more pieces of fabric secured together to form a container having at least a base and four sides, and a pair of reinforcing members defining a 45 respective channel for receiving the tines of a fork lift, which reinforcing members are secured to the base of the bag by means of loops which depend from the base of the bag.

In the preferred embodiment, the bottom and 50 two sides are formed from one continuous length of material, and the loops are formed in the same length of material. Thus, the loops are elongate and correspond in length to the width of the bag. The loops preferably depend from the base at a 55 location disposed inwardly from the said two sides. The loop is formed by folding part of the material over on itself and stitching or welding the material together adjacent the base.

The reinforcing members are preferably elongate 60 box section members formed from wood. Each box section member may comprise two elongate side members and a plurality of spaced apart battens secured to the top and bottom of the side members and extending there-between. Alternatively, the top and bottom members may comprise 65

a respective elongate plank member.

In an alternative the fabric loops may be separate from the material forming the base and secured thereto by stitching or welding. The bag can 70 be made from any suitable fabric including man made plastic materials such as woven polypropylene, polyester or extruded plastic. The polypropylene may be coated with polyethylene. Conductive threads may be incorporated in the material.

75 Any convenient method and any number of pieces of material may be employed in the construction of the container which preferably includes a top wall. The top wall may form part of the continuous length forming the base and two sides, alternatively it may be part of another length 80 including the other two sides and stitched or otherwise secured to the bottom, top and side edges of the other length of fabric.

In another possible construction, each reinforcing member may be located to the base by means 85 of a number of loops made up of webbing or the like, which are secured to the base of the bag. The reinforcing members may take the form of an open channel member where the material of construction makes this possible. It is possible for the reinforcing members to be made from plastic as an 90 extrusion or injection moulding. They may be hollow or open section. The weight may be reduced by perforating the walls.

95 The present invention will now be described further, by way of example only, with reference to the accompanying drawings; in which:-

*Figure 1* is a side view of a container bag in accordance with the present invention shown filled;

100 *Figure 2* is a schematic perspective view of an open top container bag before insertion of the reinforcing members;

*Figure 3* is a perspective view of a typical reinforcing member;

105 *Figure 4* is a schematic perspective view of a container bag according to the present invention with a top skirt showing one reinforcing member in position and another partially inserted, and

110 *Figure 5* is a schematic perspective view of another embodiment of container bag in accordance with the invention having a top spout.

Referring to the drawings of the various embodiments of flexible intermediate bulk container bag, like reference numerals have been used to denote 115 corresponding parts in the illustrated embodiments. The container has sides 1, 3 and a base 5. Two other opposite sides (2,4) are stitched to the edges of the sides 1,3 and the base to define a flexible container for holding any desired material.

120 The embodiment of Fig. 2 has an open top, whilst the embodiment of Fig. 4 has a top wall formed by four top skirts 6 stitched together at the adjacent edges. The embodiment of Fig. 5 has a top wall formed by a top spout 8, used for filling, and which is closed by tying off. The corners of the bag may be provided with loops 10 for holding the bag open during filling.

125 Depending from the base 5 are two loops 7,9 and received inside each loop is a respective reinforcing member 11,13. The reinforcing member is 130

a hollow box shaped component. The reinforcing members 11,13 serve as guides for receiving the tines of a fork lift mechanism.

The sides 1,3, base 5 and loops 7,9 are conveniently formed from one length of material with the material of the loop stitched, welded or otherwise secured together adjacent the base as shown at 15. As illustrated, the loops depend from the base at a location spaced from the sides of the container and this is a preferred construction. The area 17 of the base between the loops serves as a discharge point for the container. The discharge may be made by slitting open the base in this region. Alternatively, a closeable discharge orifice and/or shute may be provided, to render the container reusable.

As shown, the loops are directed outwardly from the point of attachment to the base. As an alternative, the loops may be directed inwardly, that is to say, the point of attachment may be adjacent the sides 1,3 of the container. Means may be provided to restrain the ends of the loop from movement so as to hold the reinforcing members in substantially the desired illustrated position i.e. horizontally.

It is preferred that the container be made from polypropylene, but any other convenient fabric may be employed, for example, polyester or polyethylene. The fabric is preferably woven.

The reinforcing members 11,13 are hollow structures, conveniently made from wood with two sides 19,21 and top and bottom 23,25. The top and bottom may be made up of one plank or a plurality of strips secured to the sides 19,21 and similar in construction to conventional wooden pallets.

As an alternative where economies of scale permit the reinforcing members may be extruded or moulded from plastics in any convenient shape. A box section is preferred but a channel section suitably braced with part or all of the bottom omitted may be feasible for certain applications.

As a further alternative the loops 7,9 may be secured to the base rather than form part of the base material. Any convenient securing method can be employed.

As a further alternative, each reinforcing member 11,13 may be secured or retained to the container by two or more straps, instead of using a loop which is the full width of the container. These may be secured to the container by stitching.

Where the loops are formed by stitching separate pieces of material or webbing to the base of the container, the base may form part of the loop by stitching each end of the separate pieces at different locations. The essential requirement being that two loops are formed on the base for retaining a respective reinforcing member.

The reinforcing members may be of variable width, that is to say, different widths of reinforcing member may be employed in different embodiments. The sleeves may be arranged to terminate approximately in line with the sides 1,3 of the container, as shown in Fig. 4, or may extend beyond the sides as shown in Figs. 1 and 5. The reinforcing members are preferably dimensioned to receive all sizes of fork lift tines commonly available.

The width-wise positioning of reinforcing members is also determined by the location of the loops.

The described embodiments enable the container to be lifted from the bottom, by inserting the fork lift tines into the channels formed by the reinforcing members and enables discharge from the bottom in the space between the reinforcing members. The reinforcing members are located on the container in a simple manner so effectively forming a single assembly and avoiding the likelihood of separation.

#### CLAIMS

1. An intermediate bulk container bag comprising one or more pieces of fabric secured together to form a container having at least a base and four sides, and a pair of reinforcing members defining a respective channel for receiving the tines of a fork lift, which reinforcing members are secured to the base of the bag by means of loops which depend from the base of the bag.

2. An intermediate bulk container bag as claimed claim 1 in which one or more loops are provided to secure each reinforcing member to the base of the bag.

3. An intermediate bulk container bag as claimed in claim 2 in which said one loop comprises a piece of material folded over on itself and stitched or welded to form an elongate loop.

4. An intermediate bulk container bag as claimed in claim 1 in which the bottom and two sides of the bag are formed from one continuous length of material, and the loops are formed in the same length of material.

5. An intermediate bulk container bag as claimed in claim 4 in which the loops correspond in length to the width of said sides.

6. An intermediate bulk container bag as claimed in claim 4 or 5 in which the loop is formed by folding part of said length of material over on itself and stitching or welding the material across the width thereof.

7. An intermediate bulk container bag as claimed in any preceding claim in which the loops depend from the base of the bag at a location disposed inwardly from two opposite sides.

8. An intermediate bulk container bag as claimed in claim 3 in which the loops are separate items which are secured to the base.

9. An intermediate bulk container bag as claimed in claim 1, 2, 3 or 8 in which the loops for each reinforcing member are formed by a plurality of webbing straps and said straps are secured to the base of the bag.

10. An intermediate bulk container bag as claimed in any preceding claim in which each reinforcing member comprises an elongate box section open at opposite ends.

11. An intermediate bulk container bag as claimed in claim 10 in which each reinforcing member comprises two elongate side members and a plurality of spaced apart battens secured to the top and bottom of the side members and extending therebetween.

12. . An intermediate bulk container bag as claimed in claim 10 in which each reinforcing member comprises two elongate side members secured together by respective top and bottom elongate members.

13. . An intermediate bulk container bag as claimed in claims 10, 11 and 12 in which the reinforcing members are made of wood.

14. . An intermediate bulk container bag as claimed in any of claims 1 to 12 in which the reinforcing members are made of plastics.

15. . An intermediate bulk container bag as claimed in any preceding claim when made from a plastics material such as woven polypropylene or polyester or extruded plastic.

16. . An intermediate bulk container bag constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.